

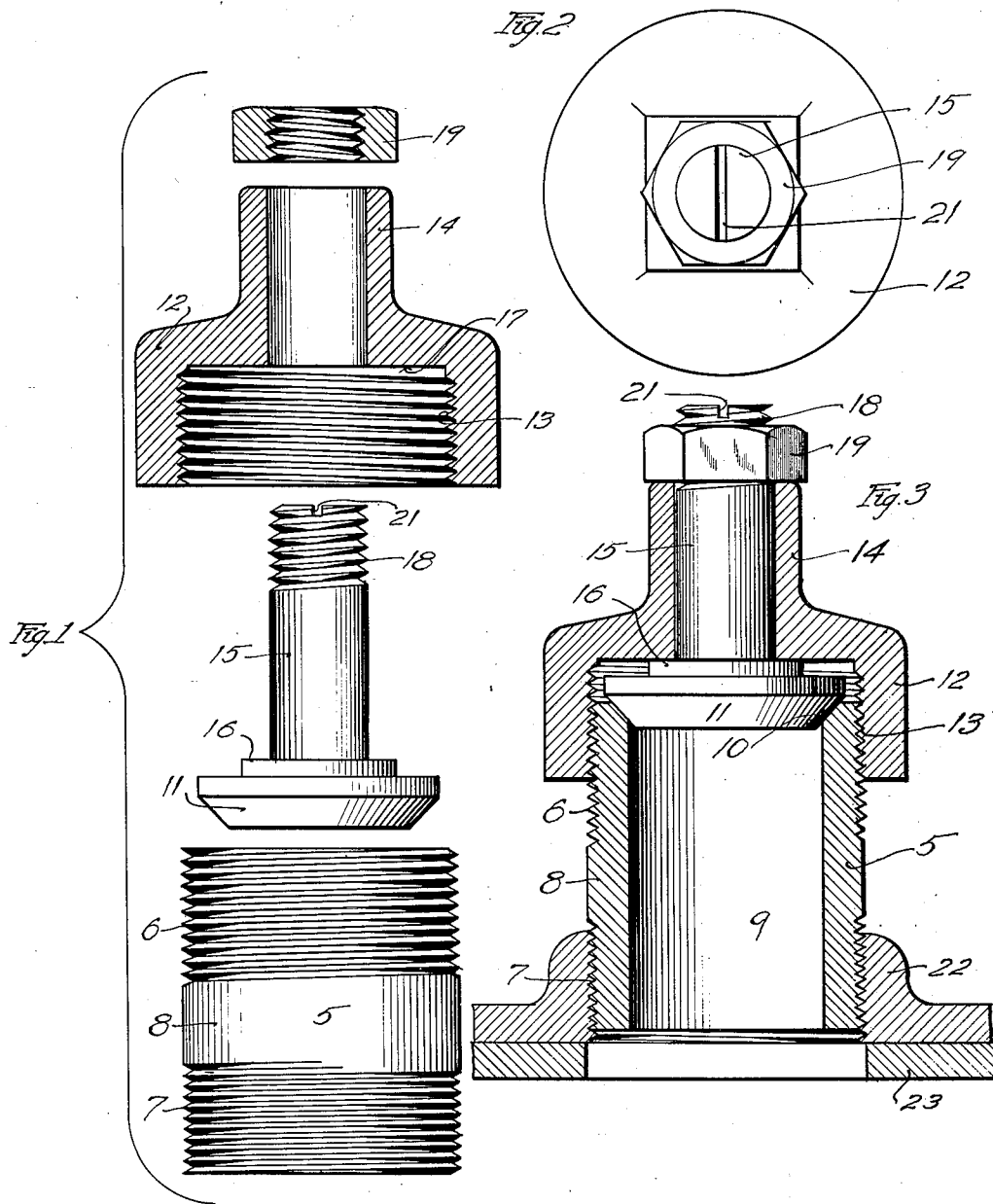
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WASHOUT PLUG FOR LOCOMOTIVE BOILERS

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WASHOUT PLUG FOR LOCOMOTIVE BOILERS.

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My invention relates to washout plugs for locomotive boilers.

The general object of the invention is to provide an improved construction of washout plug for substitution in lieu of the customary mud plug or the usual arch tube plug in locomotive boilers.

One of the particular objects of the invention is to provide a washout plug in which the valve element can be rotated backwardly and forwardly on its seat after the device has been assembled and the valve element has been brought into engagement with its valve seat. This enables scale and other refuse to be removed from between the seating surfaces and enables the valve virtually to be "ground" to its seat.

A further object is to provide a washout plug in which it is impossible to seat the valve element for sealing the device if the outer sleeve has been inserted wrong in the boiler, such as by screwing the wrong end into the thread of the boiler structure. This inability to seat the closure element apprises the mechanic immediately that the sleeve is inserted wrong and avoids subsequent leaks and the possibility of dangerous rupture from incorrect assembly.

A further object is to provide such a plug in which it is impossible to seat the closure element if the threads between the cap and the sleeve should become crossed in assembling the device. Prior devices in which a temporary closure or seal can be obtained with the threads crossed are very likely to give way under pressure and scald the engineer or fireman. In the present device, if these threads are crossed, the closure element will not seat to hold any pressure, and will be noticeably loose through test applied to its projecting stem, so that the mechanic is apprised at once of the dangerous condition of the plug.

While the invention is primarily intended for use as a washout plug for boilers, in the appended claim I have also claimed the salient features of the invention in a closure plug of more general utility, such as for use on tank cars, gas and oil containers, etc.

Referring to the accompanying drawing, in which I have illustrated my improved washout plug:

Figure 1 is an exploded or separated view of the several parts of the device;

Figure 2 is a plan view of the assembled washout plug, and

Figure 3 is a vertical sectional view through the same.

The device is assembled about a sleeve 5 which constitutes the main body member of the plug. This sleeve has two separate threads 6 and 7 formed on its opposite ends, and by making these threads of substantially the same diameter, the sleeve can be made of a section of steel tubing. The intermediate portion of the sleeve is provided with an unthreaded surface 8, which is adapted to be grasped by a Stillson wrench in screwing the sleeve into the boiler.

The two threads 6 and 7 are of dissimilar pitch to ensure correct assembly. In one typical embodiment, these threads are, respectively, ten to the inch and twelve to the inch. The inner end 7 is adapted for screwing into the boiler, as I shall presently describe.

Formed at the outer end of the bore 9 of this sleeve is a conical valve seat 10 on which is adapted to seat a conical plug valve 11. This plug valve is adapted to be held to its seat by an outer cap 12 which fits over the valve and has an internal thread 13 adapted to screw down over the outer thread 6 of the sleeve. It will be noted that the cylindrical portion of this cap is relatively long so as to carry a relatively long thread 13, whereby if the thread 13 becomes crossed or is not matched with the proper end of the sleeve, it will be impossible to screw this relatively long thread all the way down to force the valve to its seat. The upper part of the cap has a tubular neck 14, open at the upper end, and through this neck passes a stem 15 which is formed integral with the plug valve 11. This valve and stem are preferably constructed of brass. A collar or shoulder 16 at the base of the stem 14 is adapted to engage the flat under side 17 of the cap 12 for applying the seating pressure to the valve. When the cap is being screwed down onto the sleeve 5, relative rotation will occur at this point between the cap and valve, instead of between the valve and its valve seat.

The outer end of the stem 14 is threaded at 18 for receiving a nut 19 which is screwed over the stem up against the tubular neck 14. A screw driver kerf 21, or some other suitable arrangement of shoulders, is provided in or on the outer end of the stem for receiving a screw driver bit, or some other tool, by which the valve can be rotated backwards and forwards in clearing scale from the seat-

ing surfaces or for grinding the seating surfaces to a perfect fit.

As previously stated, the present washout plug is intended to be inserted in place of the old style mud plug, arch tube plug, or in any other situation in boiler construction where a plug of the present characteristics would be desirable. The flanged ring 22 and boiler plate 23 are intended as being representative of any portion of the boiler structure to which it may be desired to apply the plug. After the end 7 of the sleeve member has been threaded into the boiler structure, it is expanded therein, such as by a roller expander. This makes the sleeve substantially a permanent part of the boiler structure, and produces a joint which is leak-proof against all pressures to which it may be subjected in ordinary duty. After the sleeve has been thus expanded in the boiler, the remaining parts of the device are assembled on the sleeve, as shown in Fig. 3.

If, in the mounting of this sleeve in the boiler, the wrong end should have been inserted, so that the end 7 is outermost, the cap 12 cannot be screwed down sufficiently far to force the valve to its seat because of the difference in pitch of the threads. The consequent imperfect closure between the valve and is valve seat, or the looseness of the valve, will be instantly detectable through the stem 15 and through leakage as soon as water is fed to the boiler. The difference of pitch between the threads at the opposite ends of the sleeve will also result in the sleeve being screwed into the boiler with great difficulty if the end 6 is inserted in the ring 22. Either this difficulty of screwing the sleeve into the boiler, or the inability to seat the valve 11, will apprise the mechanic that the sleeve has been inserted incorrectly, whereupon it can be removed and reversed to place the valve seat end 10 outermost.

Assuming now that the sleeve has been inserted in the boiler properly, if, in the act of threading the cap 12 down over the valve, the threads 6 and 13 should become crossed, it will be impossible to screw the cap down sufficiently far to seat the valve. Here, again, the looseness of the valve to leakage, or to play detectable through the valve stem 15, will indicate the faulty assembly of the unit.

The foregoing safety features provide ample safeguards against incorrect assembly or any other condition which might result in the plug blowing out or developing a dangerous leak. These safety factors are of considerable value in meeting the requirements of locomotive boiler inspection laws.

The considerable pressure which can be exerted through the threads 6 and 13 enables the valve 11 to be held to its seat under

ample pressure to seal it against all boiler pressures to which it may be subjected. This pressure is also effective to seal the joint between the shoulder 16 and the under side 17 of the cap. Screwing down on the nut 19 also serves to seal the joint between the shoulder 16 and the under side of the cap, and also forms a closed joint between the top of the tubular neck and the under side of the nut. The provision of this nut also serves to connect the valve element and the cap as a unit for assembly and removal.

In washing out the boiler, considerable mud, scale and other refuse will be blown or flushed out through the bore 9, and there will always be the possibility of some of this scale or other foreign matter lodging on the valve 11 or the valve seat 10. After replacing the valve and cap, should any of this scale or foreign matter remain on these valve surfaces, or should an imperfect joint exist between these surfaces for any other reason, the leakage resultant upon filling the boiler with water, or the creation of a slight pressure in the boiler, will immediately disclose this imperfect joint. The cap 12 and nut 19 can then be loosened to permit the valve to be rotated backwards and forwards through the medium of the slotted stem 15 to turn the valve down to a ground fit. The relatively long tubular neck 14 serves as a long guide for the valve in this seating operation. The valve face 11 should be made comparatively narrow, of approximately the proportions shown, so as to reduce the area of seating surfaces on which such scale or other foreign matter can collect.

I claim:

In a washout plug for locomotive boilers, the combination of a sleeve constructed of a section of steel tubing, separate threads at the opposite ends of said sleeve, the inner end of said sleeve being adapted to be screwed into the boiler, a conical valve seat in the outer end of said sleeve, a conical valve adapted to engage on said seat, a cap fitting over said valve and screwing down over the outer end of said sleeve, said cap having a tubular neck extending therefrom, the separate threads at the opposite ends of said sleeve being of different pitches to prevent seating of said valve if said cap should be assembled over the wrong end, a stem integral with said valve extending out through said neck, a kerf in the end of said stem for receiving a bit for rotating the valve back and forth in grinding the same upon its seat, a thread on the end of said stem, and a nut screwed down over the thread on said stem.

In witness whereof, I hereunto subscribe my name this 27th day of October, 1924.

PETER F. GALLAGHER.